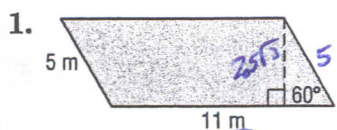


11-1 Practice

Area of Parallelograms

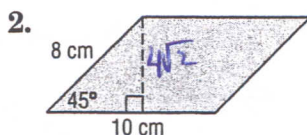
Find the perimeter and area of each parallelogram. Round to the nearest tenth if necessary.



$$A = 25\sqrt{3} \cdot 11 \quad P = 32m$$

$$= 27.5\sqrt{3}$$

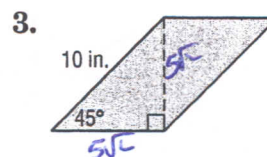
$$\approx 47.6 m^2$$



$$A = 10 \cdot 4\sqrt{2} \quad P = 36cm$$

$$40\sqrt{2}$$

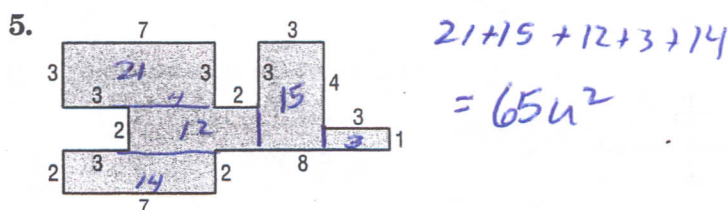
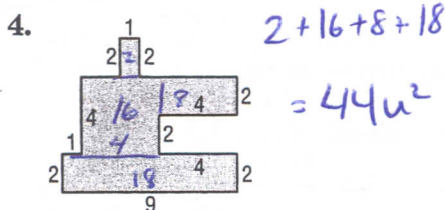
$$\approx 56.6 cm^2$$



$$A = 5\sqrt{2} \cdot 5\sqrt{2} \quad P = 20 + 10\sqrt{2}$$

$$50 in^2 \quad 34.1 in$$

Find the area of each figure.



COORDINATE GEOMETRY Given the coordinates of the vertices of a quadrilateral, determine whether it is a *square*, a *rectangle*, or a *parallelogram*. Then find the area of the quadrilateral.

6. $C(-4, -1), D(-4, 2), F(1, 2), G(1, -1)$

$DF = 5$
 $FG = 3$

$A = 15u^2$

8. $M(0, 4), N(4, 6), O(6, 2), P(2, 0)$

parallelogram

7. $W(2, 2), X(1, -2), Y(-2, -2), Z(-1, 2)$

$XY = \sqrt{(1-(-2))^2 + (-2-(-2))^2}$

$XY = 3$

$h = 4$

$A = 3 \cdot 4 = 12u^2$

9. $P(-5, 2), Q(4, 2), R(5, 5), S(-4, 5)$

FRAMING For Exercises 10–12, use the following information.

A rectangular poster measures 42 inches by 26 inches. A frame shop fitted the poster with a half-inch mat border.

10. Find the area of the poster.

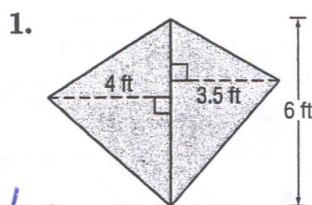
11. Find the area of the mat border.

12. Suppose the wall is marked where the poster will hang. The marked area includes an additional 12-inch space around the poster and frame. Find the total wall area that has been marked for the poster.

11-2 Skills Practice

Areas of Triangles, Trapezoids, and Rhombi

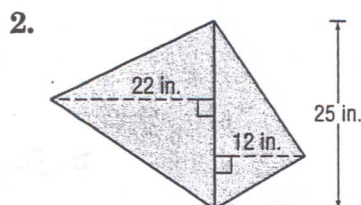
Find the area of each figure. Round to the nearest tenth if necessary.



$$A = \frac{1}{2} 4 \cdot 6 + \frac{1}{2} 4 \cdot 6$$

$$12 + 12$$

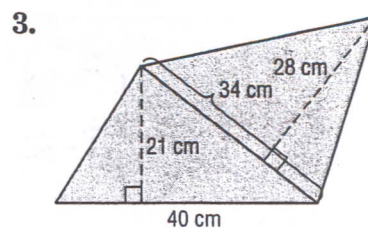
$$24 \text{ ft}^2$$



$$A = \frac{1}{2} 22 \cdot 25 + \frac{1}{2} 22 \cdot 25$$

$$275 + 275$$

$$550 \text{ in}^2$$



$$A = \frac{1}{2} 21 \cdot 40 + \frac{1}{2} 21 \cdot 40$$

$$420 + 420$$

$$840 \text{ cm}^2$$

Find the area of each quadrilateral given the coordinates of the vertices.

4. trapezoid WXYZ
W(-5, 3), X(3, 3), Y(6, -3), Z(-8, -3)

$$WX = 8$$

$$ZY = 14$$

$$h = 6$$

$$A = \frac{1}{2} 6(8 + 14)$$

$$= 66 \text{ in}^2$$

5. rhombus HIKJ
H(4, -3), I(2, -7), J(0, -3), K(2, 1)

$$KI = \sqrt{(2-0)^2 + (-7-1)^2} = 8$$

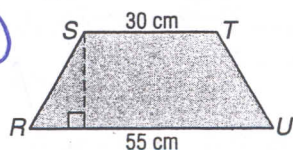
$$HI = \sqrt{(4-2)^2 + (-3-1)^2} = 4$$

$$A = \frac{1}{2} 8 \cdot 4$$

$$= 16 \text{ in}^2$$

Find the missing measure for each figure.

6. Trapezoid RSTU has an area of 935 square centimeters. Find the height of RSTU.



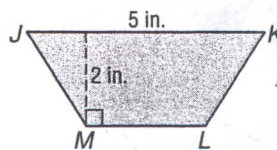
$$A = \frac{1}{2} h(b_1 + b_2)$$

$$935 = \frac{1}{2} h(30 + 55)$$

$$42.5 h$$

$$22 \text{ cm} = h$$

7. Trapezoid JKLM has an area of 7.5 square inches. Find ML.



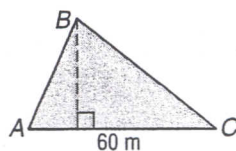
$$A = \frac{1}{2} h(b_1 + b_2)$$

$$7.5 = \frac{1}{2} 2(5 + b_2)$$

$$7.5 = 5 + b_2$$

$$2.5 = b_2$$

8. Triangle ABC has an area of 1050 square meters. Find the height of $\triangle ABC$.

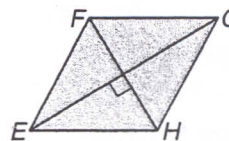


$$A = \frac{1}{2} b h$$

$$1050 = \frac{1}{2} 60 h$$

$$35 \text{ m} = h$$

9. Rhombus EFGH has an area of 750 square feet. If EG is 50 feet, find FH.



$$A = \frac{1}{2} d_1 \cdot d_2$$

$$750 = \frac{1}{2} 50 \cdot d_2$$

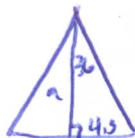
$$25 \cdot d_2$$

$$30 \text{ ft} = d_2$$

11-3 Skills Practice

Areas of Regular Polygons and Circles

Find the area of each regular polygon. Round to the nearest tenth.



1. a pentagon with a perimeter of 45 feet

$$\tan 36 = \frac{4.5}{a}$$

$$a = 6.2$$

$$A = \frac{1}{2} 6.2 \cdot 45 = 139.4 \text{ ft}^2$$

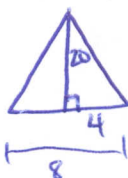
9



2. a hexagon with a side length of 4 inches

$$A = \frac{1}{2} 2\sqrt{3} \cdot 24 = 24\sqrt{3} \text{ in}^2 \approx 41.6 \text{ in}^2$$

4



3. a nonagon with a side length of 8 meters

$$\tan 20 = \frac{4}{a} \quad a = 11.0$$

$$A = \frac{1}{2} 11.0 \cdot 72 \approx 395.6 \text{ m}^2$$

4. a triangle with a perimeter of 54 centimeters

$$54 \div 3 = 18 - \text{side}$$

$$A = \frac{5^2 \sqrt{3}}{4}$$

$$A = \frac{18^2 \sqrt{3}}{4}$$

$$= 81\sqrt{3} \text{ cm}^2 \approx 140.3 \text{ cm}^2$$

Find the area of each circle. Round to the nearest tenth.

5. a circle with a radius of 6 yards

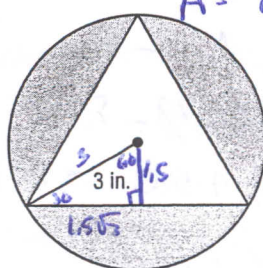
$$A = 36\pi \text{ yds}^2 \approx 113.1 \text{ yds}^2$$

6. a circle with a diameter of 18 millimeters

$$A = 81\pi \text{ mm}^2 \approx 254.5 \text{ mm}^2$$

Find the area of each shaded region. Assume that all polygons are regular. Round to the nearest tenth.

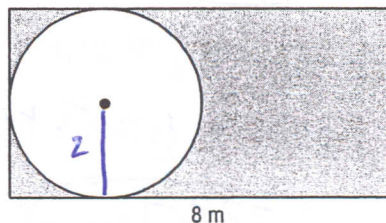
7.



$$A = 9\pi - \frac{1}{2} 6 \cdot (3\sqrt{3})$$

$$= 16.6 \text{ in}^2$$

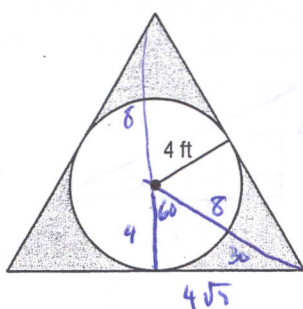
8.



$$A = 8 \cdot 4 - 4\pi$$

$$= 19.4 \text{ m}^2$$

9.



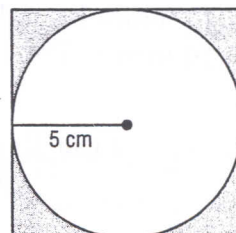
$$A = A_b - A_c$$

$$= \frac{1}{2} 4 \cdot 24\sqrt{3} - 16\pi$$

$$= 48\sqrt{3} - 16\pi$$

$$32.9 \text{ ft}^2$$

10.



$$A_{sq} - A_{cr}$$

$$100 - 25\pi$$

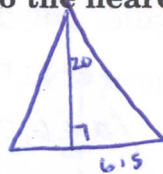
$$21.5 \text{ cm}^2$$

11-3 Practice**Areas of Regular Polygons and Circles**

Find the area of each regular polygon. Round to the nearest tenth.

1. a nonagon with a perimeter of 117 millimeters

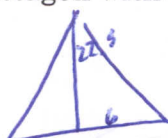
$$A = \frac{1}{2} \cdot 12.9 \cdot 117 = 1044.7 \text{ mm}^2$$



$$\text{km } 20 = \frac{6.5}{a}$$

$$a = 12.9$$

2. an octagon with a perimeter of 96 yards



$$\text{km } 22.5 = \frac{6}{a}$$

$$a = 14.5$$

$$A = \frac{1}{2} \cdot 14.5 \cdot 96 = 695.3 \text{ yds}^2$$

Find the area of each circle. Round to the nearest tenth.

3. a circle with a diameter of 26 feet

$$= 169\pi \text{ ft}^2$$

4. a circle with a circumference of 88 kilometers

$$88 = \pi d$$

$$28.0 = d$$

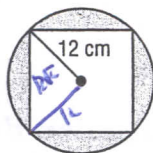
$$r = 14.0$$

~~116.2~~

$$A = 616.2 \text{ km}^2$$

Find the area of each shaded region. Assume that all polygons are regular. Round to the nearest tenth.

5.



$$A_c - A_s$$

$$144\pi - (12\sqrt{2})^2$$

$$144\pi - 288$$

$$164.4 \text{ cm}^2$$

6.



$$P = 13.2\sqrt{3}$$

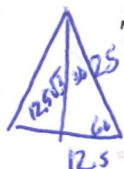
$$A_c - A_\Delta$$

$$4.4^2\pi - \frac{1}{2} \cdot 2.2 \cdot 13.2\sqrt{3}$$

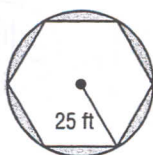


$$35.7 \text{ in}^2$$

7.



$$p = 25 \cdot 6$$

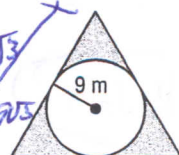


$$A_c - A_H$$

$$25^2\pi - \frac{1}{2} \cdot 12.5\sqrt{3} \cdot 150$$

$$339.7 \text{ ft}^2$$

8.



$$P = 13.2\sqrt{3}$$

$$A_\Delta - A_c$$

$$81\pi - 81\pi$$

$$\frac{1}{2} \cdot 9 \cdot 50\sqrt{3} - 81\pi = 166.4 \text{ m}^2$$

DISPLAYS For Exercises 9 and 10, use the following information.

A display case in a jewelry store has a base in the shape of a regular octagon. The length of each side of the base is 10 inches. The owners of the store plan to cover the base in black velvet.

9. Find the area of the base of the display case.

10. Find the number of square yards of fabric needed to cover the base.

